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## FACSIMILE COVER SHEET

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DATE: April 15, 2008

TO: Examiner Edward M. Johnson  
Group Art Unit 1754

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612.746.3006 faxApplication No.: 09/757,519  
Applicant: Horne et al.  
Due Date: May 3, 2008

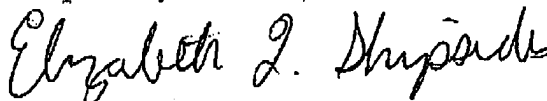
OUR REF.: 3132.07US02

FROM: Elizabeth Q. Shipsides  
PHONE #: 612.605.1045

Attached is the following for filing in the above-identified application.

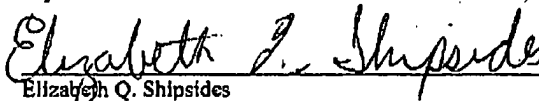
- (1) Appeal Brief Transmittal;
- (2) Appeal Brief;
- (3) Appealed Claims Appendix;
- (4) Evidence Appendix with Three Patents; and
- (5) Related Proceedings Appendix with Decision.

Respectfully submitted,

Elizabeth Q. Shipsides  
Registration No. 57,529

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Elizabeth Q. Shipsides

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Attorney Docket No. 3132.07US02

## APPEAL BRIEF TRANSMITTAL

In re the application of:

Horne et al.

Confirmation No.: 3132.07US02

Application No.: 09/757,519

Examiner: Johnson, Edward M.

Filed: January 9, 2001

Group Art Unit: 1754

For: METAL VANADIUM OXIDE PARTICLES

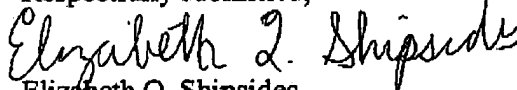
Mail Stop Appeal Brief-Patents  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

Transmitted herewith, is the Appeal Brief in the above-identified application, with respect to the Second Notification of Non-Complaint Appeal Brief mailed April 3, 2008.

Applicants previously paid \$250 for the filing of an Appeal Brief in this matter on August 20, 2003. Applicants believe that no additional fees are due, but please charge the below deposit account if that assessment is in error to ensure entry of this Brief.

Respectfully submitted,



Elizabeth Q. Shipsides

Registration No. 57,529

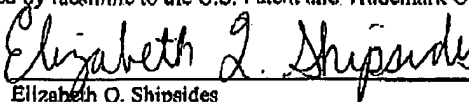
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE APR 15 2008

In re the application of:

Attorney Docket No.: 3132.07US02

Horne et al.

Confirmation No.: 8679

Application No.: 09/757,519

Examiner: Edward M. Johnson

Filed: January 9, 2001

Group Art Unit: 1754

For: METAL VANADIUM OXIDE PARTICLES

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

## BRIEF FOR APPELLANT

**RECEIVED**  
**CENTRAL FAX CENTER**  
**APR 15 2008**

2

Application No. 09/969,025

## PATENT APPLICATION

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the application of:

Attorney Docket No.: 3132.07US02

Horne et al.

Confirmation No.: 8679

Application No.: 09/757,519

Examiner: Edward M. Johnson

Filed: January 9, 2001

Group Art Unit: 1754

For: METAL VANADIUM OXIDE PARTICLES

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES  
SECOND CORRECTED APPEAL BRIEF

Mail Stop Appeal Brief - Patents  
Commissioner for Patents  
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Alexandria, VA 22313-1450

Sir:

INTRODUCTORY COMMENTS

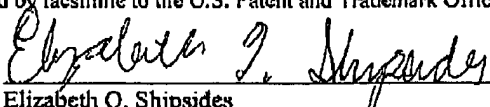
This is an appeal from an Office Action dated July 16, 2007, in which claims 1-3, 10, 17-22, and 24-29 were finally rejected. The rejection of claims 1-3, 10, 17-22, and 24-29 are hereby appealed. A Notice of Appeal was filed on August 7, 2007. A second Notice of Non-Compliant Amendment was mailed on April 3, 2008. This second Corrected Appeal Brief is timely filed in response to the Notice of Non-Compliant Brief of April 3, 2008. The Evidence Appendix coversheet includes a statement setting forth where in the record that the evidence was entered by the Examiner.

*Please grant any extension of time necessary for entry; charge any fee due to Deposit Account No. 50-3863.*

## CERTIFICATE OF FACSIMILE TRANSMISSION

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April 15, 2008  
Date

  
Elizabeth Q. Shippides

**REAL PARTY IN INTEREST**

Greatbatch, Ltd. (previously known as Wilson Greatbatch Technologies, Inc.), has acquired the entire right, title and interest in and to the invention, the application, and any and all patents to be obtained therefore. Greatbatch was assigned the patent application by NanoGram Corporation, a corporation organized under the laws of the state of Delaware, and having offices at 165 Topaz St., Milpitas, California. On June 17, 2004, an assignment was executed transferring ownership from NanoGram Corporation to Wilson Greatbatch Technologies, Inc. recorded at reel 015552, frame 0199, although NanoGram Corp. may have retained certain licensed rights. The rights in the patent application were transferred to NanoGram Corp. as per the Assignment, recorded at Reel 011451, Frame 0570 from the inventors to NeoPhotonics Corporation and an assignment from NeoPhotonics Corporation to NanoGram Corporation recorded at Reel 013957, Frame 0076. Note that NeoPhotonics Corporation was formerly called NanoGram Corporation, and the present NanoGram Corporation is an independent corporation spun out from NeoPhotonics Corp.

**RELATED APPEALS AND INTERFERENCES**

U.S. Patent application 09/606,884 was appealed to the USPTO Board of Patent Appeals and Interferences. This application has now issued as U.S. Patent 7,214,446. This patent is assigned to NanoGram Corporation. A copy of the decision is attached. It is noted that the decision reversed the rejection.

**STATUS OF CLAIMS**

Claims 1-3, 6-18 and 22-29 are pending. Claims 4, 5 and 19-21 have been cancelled. Claims 1-3, 10, 17, 22, and 24-29 stand rejected. Claims 6-9, 11-16, 18, and 23 are free of any rejections and are objected to for depending on a rejected base claim.

In multiple Office Actions from December 28, 2001 through January 27, 2003, Examiner indicated that claims 11-16 and 18 contained allowable subject matter. After Applicant filed a Notice of Appeal and multiple Appeal Briefs beginning on August 20, 2003, Examiner issued a non-final Office Action dated February 7, 2007 without considering pending claims 11-16 and 18. Applicant notes that the Patent Office lost an initially filed Appeal Brief and significant delay resulted. The Office Action of February 7, 2007 had an error with respect to dropping claims 11-16 and 18 from the application. Applicant inadvertently propagated this error in a Response filed on May 11, 2007. Applicant maintains that these claims were never canceled and remain pending and allowable.

The appealed claims are listed in the Claims Appendix.

#### **STATUS OF AMENDMENTS**

All Amendments have been entered with the filing of the Appeal.

#### **SUMMARY OF CLAIMED SUBJECT MATTER**

The invention relates to powders, i.e., collections of particles, having a composition of a metal vanadium oxide. (See, for example, the abstract.) Metal vanadium oxides have a non-vanadium metal ion along with a vanadium ion within an oxide composition. (Specification, for example, page 4, lines 10-23.) The claimed composite metal oxide particles have an average particle size less than a micron. (Specification, for example, page 5, lines 1-18. Figs. 11 and 12, for example.)

Any particular powder has particles that can be characterized by size. A collection of particles has an average particle size and a distribution of particle sizes, which are related but separate properties. The distribution of particle sizes relate to the size uniformity of the particles. Some of the pending claims specify particular distributions corresponding to highly uniform

particles. (Specification, for example, page 31, lines 3-26. Fig. 12, for example. Claim group 4.) All of the claims directed to particle collections have a submicron average particle size. (Specification, for example, page 30, lines 1-19. Figs. 11, 12, 15, and 16, for example. Independent claim 1. Claim group 1.) In some embodiments, the particles have an average particle size from about 5 nm to about 100 nm (claim group 2), and in further embodiments, the particles have an average particle size from about 5 nm to about 50 nm (claim group 3). (Specification, for example, page 30, lines 1-19. Figs. 11, 12, 15, and 16, for example.). In some embodiments, the metal vanadium oxide is crystalline. (Specification, for example, page 32, lines 10-14. Figs. 9-12, for example. Claim group 5).

Some of the pending claims relate to methods for forming metal vanadium oxide particles. (Independent claim 10. Claim group 4.) In the claimed methods, the metal vanadium oxide particles are formed by heating a mixture of vanadium oxide particles with a non-vanadium metal compound. (Specification, for example, page 26, line 29 to page 27, line 10. Figs. 6 and 7, for example.) The reactant vanadium oxide particles have an average particle size less than a micron. (Specification, for example, page 27, lines 11-22. Fig. 16, for example.) Applicants' specification describes the formation of submicron vanadium oxide particles using a process called laser pyrolysis. (Specification, for example, page 4, lines 26-33 and Example 1. Fig. 1, for example.). Through the description of the laser pyrolysis approach, Applicants' specification enables the formation of the starting materials for the formation of submicron metal vanadium oxide materials. (Specification, for example, page 5, lines 1-18 and page 6, lines 18-27. Figs. 1-6, for example.) The present application does not claim the formation of particles with laser pyrolysis.

Additional claims are directed to batteries formed with submicron metal vanadium oxide particles. (Independent claim 17. Claim group 1.) In particular, metal vanadium oxide particles are useful as cathode materials, especially for lithium-based batteries. (Specification, for example, page 34, line 14-page 36, line 24. Fig. 8, for example.) The submicron character of the metal vanadium

oxide particles can contribute improved performance in battery applications. (Specification, for example, page 34, line 14-page 36, line 24. Fig. 8, for example.)

#### **GROUND OF REJECTION TO BE REVIEWED ON APPEAL**

- A. The rejection of claims 1 and 17 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent 5,512,214 to Koksbang.
- B. The rejection of claims 1, 2, 17, 24, and 26 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent 5,549,880 to Koksbang
- C. The rejection of claims 1-3, 10, 22, and 24-29 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 5,556,738 to Takamuki et al.

#### **ARGUMENT**

The following argument is organized around the following grouping of claims, which is summarized for the convenience of the Board.

- 1. Claims 1, 17, 22, 24 and 26 are within a first claim group directed to a collection of metal vanadium oxide particles or batteries formed with metal vanadium oxide particles with the particles having a specified average particles size.
- 2. Claim 2 is in a second claim group directed to a collection of metal vanadium oxide particles with an average diameter from about 5 nm to about 100 nm.



3. Claim 3 is in a third claim group directed to a collection of metal vanadium oxide particles with an average diameter from about 5 nm to about 50 nm.
4. Claims 10 and 25 are within a fourth claim group directed to a method for producing metal vanadium oxide particles using vanadium oxide particles with a specified average particle size range.
5. Claims 27-29 are within a fifth claim group directed to crystalline metal vanadium oxide.

#### LEGAL AUTHORITY

The Court of Appeals for the Federal Circuit has exclusive appellate jurisdiction for cases arising under the patent law under 28 U.S.C. § 1295 (a)(1). The Federal Circuit has adopted as binding precedent all holdings of its predecessor courts, the U.S. Court of Claims and the U.S. Court of Customs and Patent Appeals. South Corp. v. U.S., 215 USPQ 657 (Fed. Cir. 1982). Therefore, unless they have been overruled en banc, CCPA cases are binding precedent for the present appeal.

#### A. ANTICIPATION

##### 1. A Single Reference Must Disclose Every Element Set Forth In a Claim To Anticipate The Claim

"For a prior art reference to anticipate in terms of 35 U.S.C. § 102, every element of the claimed invention must be identically shown in a single reference. **These elements must be arranged as in the claim under review**, but this is not an 'ipsissimis verbis' test." In re Bond, 15 USPQ2d 1566, 1567 (Fed. Cir. 1990)(Internal citations omitted and emphasis added.).

"If the prior art reference does not expressly set forth a particular element of the claim, that reference still may anticipate if that element is 'inherent' in its disclosure. To establish

inherency, the intrinsic evidence must make it clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient." In re Robertson, 49 USPQ2d 1949, 1950, 1951 (Fed. Cir. 1999), citing Continental Can Co. v. Monsanto Co., 20 USPQ2d 1746, 1749 (Fed. Cir. 1991).

"Every element of the claimed invention must be literally present, arranged as in the claim. The identical invention must be shown in as complete detail as is contained in the patent claim." Richardson v. U.S. Suzuki Motor Corp., 9 USPQ2d 1913, 1920 (Fed. Cir. 1989)(Internal citations omitted, and emphasis added.). "Here, as well, anticipation is not shown by a prior art disclosure which is only 'substantially the same' as the claimed invention." Jamesbury Corp. v. Litton Industrial Products, Inc., 225 USPQ 253, 256 (Fed. Cir. 1985)(emphasis added).

## 2. Ranges

Claims covering a range of composition narrower than a broader range covered in the prior art are not anticipated, although they may be obvious over the prior art. In re Malagari, 182 USPQ 549, 553 (CCPA 1974). Such claims are analogous to the claim of a species or subgenus within a genus, which may be patentable and generally are not obvious. "Anticipation requires a showing that each limitation of a claim is found in a single reference, either expressly or inherently. It is well established that the disclosure of a genus in the prior art is not necessarily a disclosure of every species that is a member of that genus. There may be many species encompassed within a genus that are not disclosed by a mere disclosure of the genus. On the other hand, a very small genus can be a disclosure of each species within the genus." Atofina v. Great Lakes Chem. Corp., 441 F.3d 991, 999, 78 USPQ2d 1417, 1423 (Fed. Cir. 2006).

A prima facie case of obviousness exists if the claimed ranges "overlap or lie inside ranges disclosed by prior art." In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); In re Woodruff, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990); In re Geisler, 116 F.3d 1465, 1469-71, 43 USPQ2d 1362, 1365-66 (Fed. Cir. 1997). If the claimed ranges do not overlap with the prior art ranges, a prima facie case of obviousness exists if they are so close that one skilled in the art would have expected them to have the same properties. "[A] prior art reference that discloses a range encompassing a somewhat narrower claimed range is sufficient to establish a prima facie case of obviousness." In re Peterson, 315 F.3d 1325, 1330, 65 USPQ2d 1379, 1382-83 (Fed. Cir. 2003). See also In re Harris, 409 F.3d 1339, 74 USPQ2d 1951 (Fed. Cir. 2005). Based on a fact intensive inquiry, a range may be disclosed in multiple prior art references instead of a single prior art reference. Iron Grip Barbell Co., Inc. v. USA Sports, Inc., 392 F.3d 1317, 1322, 73 USPQ2d 1225, 1228 (Fed. Cir. 2004).

## B. OBVIOUSNESS

### 1. The Examiner Bears The Burden Of Demonstrating Obviousness.

The Applicants note that the patent office has the burden of persuasion in showing that the Applicants are not entitled to a patent. "[T]he conclusion of obviousness vel non is based on the preponderance of evidence and argument in the record." In re Oetiker, 24 USPQ2d 1443, 1445 (Fed. Cir. 1992). The patent office has the ultimate burden of persuasion in establishing that an applicant is not entitled to a patent. Id. at 1447, concurring opinion of Judge Plager. "The only determinative issue is whether the record as a whole supports the legal conclusion that the invention would have been obvious." Id.

"In rejecting claims under 35 U.S.C. §103, the examiner bears the initial burden of presenting a prima facie case of obviousness." In re Rijckaert, 28 USPQ2d 1955, 1956 (Fed. Cir. 1993). If the Examiner fails to establish a prima facie case of obviousness, the obviousness

rejection must be withdrawn as a matter of law. In re Ochiai, 37 USPQ at 1131 ("When the references cited by the examiner fail to establish a prima facie case of obviousness, the rejection is improper and will be overturned"). "If examination at the initial stage does not produce prima facie case of unpatentability, then without more the applicant is entitled to grant of the patent." In re Oetiker, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992).

"Only if that burden is met, does the burden of coming forward with evidence or argument shift to the applicant." In re Rijckaert, 28 USPQ2d at 1956. "After evidence or argument is submitted by the applicant in response to an obviousness rejection, 'patentability is determined on the totality of the record, by a preponderance of the evidence with due consideration to persuasiveness of the argument.'" In re Chu, 36 USPQ2d 1089, 1094 (Fed. Cir. 1995)(quoting In re Oetiker, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992)).

## 2. The References Must Teach Or Suggest All Of The Claim Elements

Prima facie obviousness is not established if all the elements of the rejected claim are not disclosed or suggested in the cited art. In re Ochiai, 37 USPQ 1127, 1131 (Fed. Cir. 1995). ("The test for obviousness *vel non* is statutory. It requires that one compare the claim's 'subject matter as a whole' with the prior art 'to which said subject matter pertains.'") To establish obviousness of a claimed invention, all of the claim limitations must be taught or suggested by the prior art." CFMT, Inc. v. Yieldup Intern. Corp., 349 F.3d 1333 (Fed. Cir. 2003) (citing In re Royka, 490 F.2d 981 (CCPA 1974)).

To establish prima facie obviousness, all the elements of the claim must be taught or suggested by the cited references without the benefit of hindsight based on the applicant's own disclosure. "To imbue one of ordinary skill in the art with knowledge of the invention in suit, when no prior art reference or references of record convey or suggest that knowledge, is to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher." W. L. Gore & Assocs., Inc. v. Garlock, Inc., 220 USPQ 303, 312-13 (Fed. Cir.

1983). "Skill in the art does not act as a bridge over gaps in the substantive presentation of an obviousness case, but instead supplies the primary guarantee of objectivity in the process." All-Site Corp. v. VSI International Inc., 50 USPQ2d 1161, 1171 (Fed. Cir. 1999).

The Supreme Court has recently clarified that this examination of the teachings of the prior art should not be performed rigidly. It held that "The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results." KSR Intern. Co. v. Teleflex Inc., 127 S.Ct. 1727, 1739 (2007). Specifically, "a court must ask whether the improvement is more than the predictable use of prior art elements according to their established functions." Id. at 1731. "Often, it will be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person of ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue." Id. at 1740. The Court noted that "it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does." Id. at 1731. This is so because "inventions [in most, if not all, instances] rely upon building blocks long since uncovered, and claimed discoveries almost of necessity will be combinations of what, in some sense, is already known." Id. "Under the correct analysis, any need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed." Id. at 1732. See also In re Icon Health and Fitness, Inc., 83 U.S.P.Q.2d 1746, 2007 WL 2189161.

### 3. The Claimed Recited Properties Of The Claimed Compositions Of Matter Are Claim Elements

It is long established that a composition of matter is indistinguishable from its properties. In re Papesch, 137 USPQ 43, 51 (CCPA 1963); In re Cescon, 177 USPQ 264, 266 (CCPA 1973).

There are two types of properties, chemical/compositional properties and physical properties. The chemical/compositional properties of the composition of matter determine what the material is, while the physical properties relate to the interaction and behavior of the composition of matter. Often unique or unexpected physical properties are used to establish the existence of an unobvious composition when chemical/compositional properties either are unknown or do not fully represent the unobviousness of the composition. However, discovery of a surprising or unexpected physical property does not necessarily control an obviousness determination, and all the evidence under the Graham factors must be considered. See, for example, Richardson-Vicks v. Upjohn Co., 44 USPQ2d 1181, 1187 (Fed. Cir. 1997). **In the present case, the claims do not relate to the discovery of properties of previously known or suggested materials.**

Obviousness under 35 U.S.C. §103 must be evaluated by viewing the invention as a whole. In re Langer, 175 USPQ 169, 171 (CCPA 1972). "In effect, we consider the prior art 'as a whole' with the claimed subject matter 'as a whole.'" Id. This rule superseded other principles, and specifically, **"homology should not be automatically equated with prima facie obviousness."** Id. (emphasis added). "To give meaning to the language of 35 U.S.C. 103 which speaks to the subject matter 'as a whole,' we feel weight must be given the properties of a compound or composition of matter." In re Murch, 175 USPQ 89, 92 (CCPA 1972)(emphasis added).

The present claims are directed to compositions of matter or method for manipulating compositions of matter. Certain claimed aspects of the present invention are chemical/compositional properties that make the material a different composition of matter. In particular, Applicants' **claimed compositions** have several compositional features of particular relevance. First, the composition of matter comprises particles with specified properties. Specifically, the particles have a specified range of **average particle sizes**. Average particle size is a chemical/compositional property similar to chemical formula or molecular weight of a polymer.

Collections of particles with one average particle size are a different composition of matter and will have different physical properties from collections of particles with other average particle sizes.

Similarly, the distribution of particle sizes is another independent chemical/composition property of solid particles that is distinct from the average particle size. A particle collection with a particular particle size distribution is a different composition of matter and will have different physical properties from other collections of particles with different particle size distributions. Applicants have developed an approach using light/radiation-based pyrolysis to produce the highly uniform powders/particles, which is the subject of some of the present claims. These highly uniform particles can be further reacted to form other product particles with desirable properties. A particle collection with a narrow particle size distribution is more uniform.

4. To Support A Finding Of Obviousness Based On Cited Art, The Cited Art Must Provide A Means Of Obtaining The Claimed Composition Or Apparatus

The proposition is well established that the cited art only renders a composition of matter or apparatus unpatentable to the extent that the cited art enables the disputed claims, in other words, if the cited art provides a means of obtaining the claimed composition or apparatus.

To the extent that anyone may draw an inference from the Von Bramer case that the mere printed conception or the mere printed contemplation which constitutes the designation of a 'compound' is sufficient to show that such a compound is old, regardless of whether the compound is involved in a 35 U.S.C. 102 or 35 U.S.C. 103 rejection, we totally disagree. ... We think, rather, that the true test of any prior art relied upon to show or suggest that a chemical compound is old, is whether the prior art is such as to place the disclosed 'compound' in the possession of the public. In re Brown, 141 USPQ 245, 248-49 (CCPA 1964)(emphasis in original)(citations omitted).

Similarly, see In re Hoeksema, 158 USPQ 596, 600 (CCPA 1968)(emphasis in original):

We are certain, however, that the invention as a whole is the claimed compound and a way to produce it, wherefore appellant's argument has substance. There has been no showing by the Patent Office in this record that the claimed compound can exist because there is no

showing of a known or obvious way to manufacture it; hence, it seems to us that the 'invention as a whole,' which section 103 demands that we consider, is not obvious from the prior art of record.

While there are valid reasons based on public policy as to why this defect in the prior art precludes a finding of obviousness under section 103, *In re Brown*, supra, its immediate significance in the present inquiry is that it poses yet another difference between the claimed invention and the prior art which must be considered in the context of section 103. So considered, we think the differences between appellant's invention as a whole and the prior art are such that the claimed invention would not be obvious within the contemplation of 35 U.S.C. 103.

The Federal Circuit has further emphasized these issues. "But to be prior art under section 102(b), a reference must be enabling. That is, it must put the claimed invention in the hands of one skilled in the art." *In re Sun*, 31 USPQ2d 1451, 1453 (Fed. Cir. 1993)(unpublished). Assertions in a prior art reference do not support an anticipation or obviousness rejection unless the references place the claimed invention in the hands of the public. *Beckman Instruments Inc. v. LKB Produkter AB*, 13 USPQ2d 1301, 1304 (Fed. Cir. 1989). "In order to render a claimed apparatus or method obvious, the prior art must enable one skilled in the art to make and use the apparatus or method." *Id.* While a properly citable reference is prior art for all that it teaches, references along with the knowledge of a person of ordinary skill in the art must be enabling to place the invention in the hands of the public. *In re Paulsen*, 31 USPQ2d 1671, 1675 (Fed. Cir. 1994). See also *In re Donohue*, 226 USPQ 619, 621 (Fed. Cir. 1985).

##### 5. Obviousness Over A Single Prior Art Reference

The importance of the principle that the prior art itself must suggest the motivation to modify the teachings of a reference was eloquently stated in *In re Rouffet*, 47 USPQ2d 1453, 1458 (Fed. Cir. 1998)(emphasis added):

The Board did not, however, explain what specific understanding or technical principle within the knowledge of one of ordinary skill in the art would have suggested the combination. **Instead the board merely invoked the high level of skill in the field of the art. If such a rote invocation could suffice to supply a motivation to combine, the more sophisticated scientific fields would rarely, if ever, experience a patentable technical advance. Instead, in complex scientific**



15

Application No. 09/969,025

fields, the Board could routinely identify the prior art elements in an application, invoke the lofty level of skill, and rest its case for rejection. **To counter this potential weakness in the obviousness construct, the suggestion to combine requirement stands as a critical safeguard against hindsight analysis and rote application of the legal test for obviousness.**

Similar principles must be applied when obviousness is based on the teachings of a single cited reference.

In appropriate circumstances, a single prior art reference can render a claim obvious. However, there must be a showing of a suggestion or motivation to modify the teachings of that reference to the claimed invention in order to support the obviousness conclusion. This suggestion or motivation may be derived from the prior art reference itself, from the knowledge of one of ordinary skill in the art, or from the nature of the problem to be solved. **Determining whether there is a suggestion or motivation to modify a prior art reference is one aspect of determining the scope and content of the prior art, a fact question subsidiary to the ultimate conclusion of obviousness.**

Sibia Neurosciences, Inc. v. Cadus Pharmaceutical Corp., 55 USPQ2d 1927, 1931 (Fed. Circuit 2000)(internal citations omitted, emphasis added).

#### ANALYSIS

##### A. REJECTIONS OVER KOKSBANG '214 - First Ground of Rejection

The Examiner rejected claims 1 and 17 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent 5,512,214 to Koksbang (the Koksbang '214 patent). Applicants respectfully request reconsideration of the rejection based on the following analysis. The Koksbang '214 patent does not prima facie anticipate Applicants' claimed invention.

Claim 1 recites: "A collection of particles comprising metal vanadium oxide, the particles having an average diameter less than about 1 micron." The Examiner asserted that the Koksbang '214 patent "discloses a battery comprising metal vanadium oxide particles (abstract) of 'submicron' size (see column 6, lines 7-8)." The Koksbang '214 patent, however, does not disclose "particles comprising metal vanadium oxide, the particles having an average diameter less than about 1

micron.” Col. 6, lines 7 and 8 of the Koksang ‘214 patent as cited by the Examiner has been taken out of context. The disclosure relates to vanadium oxide halogens NOT metal vanadium oxide. See col. 5, line 58-col. 6, line 8. Halogens are not metals. Thus, these materials are simply not relevant with respect to Appellant’s claims.

Furthermore, the disclosure refers to what the individual size of the particles might be and NOT to the average diameter of the particles. The vague disclosure that “[s]uch particles are of micron or submicron size” does not mean the average diameter of the particles will be less than about 1 micron. The average of these particles that are of micron or submicron size will not necessarily be less than about 1 micron.

Additionally, the Koksang ‘214 patent is directed to forming vanadium oxide particles having an average size less than 100 microns, desirably less than 50 microns, and preferably, less than 10 microns. See, for example, col. 4, line 67-col. 5, line 4. The Koksang ‘214 patent does not disclose an average particle size of less than about 1 micron, as disclosed and claimed by Applicants. It is well established that a broader range is clearly not anticipated by a narrower range. Additionally, this disclosure of average size of vanadium oxide particles does not relate to metal vanadium oxide particles but relates to commingling of carbon and vanadium oxide particles. Although the abstract and an embodiment of the invention does mention lithium vanadium oxide, it also vaguely discloses that “particle size of the lithium vanadium oxide is on the order of that described earlier in connection with  $V_2O_5$  and  $V_6O_{13}$ .” See, for example, col. 5, lines 29-31. It appears that the lithium vanadium oxide particles formed also have approximately an average size less than 100 microns, desirably less than 50 microns, and preferably, less than 10 microns. As discussed above, this does not amount to disclosing an average particle size of less than about 1 micron.

In summary, the only submicron particles referenced in Koksang ‘214 do not refer either to average particle size or even to the materials in Appellant’s claims. The vanadium oxide particles,

which also are not metal vanadium oxide particles, are not described with respect to the average particle size of Appellant's claims. Therefore, the Koksbang '214 patent simply does not anticipate Applicants' claimed invention. The Examiner has failed to establish a case of prima facie anticipation. Also, the Examiner has failed to assert any case for obviousness.

In order to render a claimed process obvious, the cited references must place the claimed process in the hands of the public. The Koksbang '214 patent does not disclose how to form vanadium oxide particles with an average particle size less than a micron. The range disclosed in the Koksbang '214 patent is a factor of ten greater than Applicants' claimed average particle size. The Examiner has not indicated how such a reduction in particle size can be performed. While the Koksbang '214 patent disclosed the desirability of having smaller average particle sizes, the Koksbang '214 patent does not indicate that particles with an average particle size less than a micron are achievable. This gap with respect to smaller vanadium oxide particles in the disclosure of the Koksbang '214 patent strongly suggests that Koksbang '214 patent does not enable a person of ordinary skill in the art to form submicron vanadium oxide particles.

In summary, the Koksbang '214 patent simply does not prima facie anticipate Applicants' claimed invention. The Examiner has not indicated any basis for establishing prima facie obviousness. Applicants do not have the burden to establish patentability, although Applicants' do not see any issues within the references of record that call patentability into question.

Since a prima case for anticipation or obviousness has not been established by the Examiner, Applicants respectfully request withdrawal of the rejection of claim 10 under 35 U.S.C. § 102(b) as being anticipated by the Koksbang '214 patent.

**B. REJECTION OVER KOKSBANG '880 - Second Ground of Rejection**

The Examiner rejected claims 1, 2, 17, 24, and 26 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent 5,549,880 to Koksang (the Koksang '880 patent). Applicants respectfully request reconsideration of the rejection based on the following analysis. The Examiner has failed to establish a prima facie case of anticipation. These issues are analyzed in detail in the following.

In a related application 09/606,884, now U.S. Patent 7,214,446, that Examiner applied the same Koksang '880 patent against claims 47-52, which also involve average diameter of vanadium oxide particles. The assignee of the present application to Appellant appealed the Examiner's rejection of claims 47-52, and a decision was rendered in favor of Applicants, resulting in an allowance of the application. Appellant refers to the attached Opinion by the Board of Patent Appeals and Interferences with Appeal No. 2006-9712.

**Group 1 Claims**

The Patent Office has the burden to establish prima facie unpatentability. The rejection formally presented by the Examiner is based on anticipation, although for completeness, Appellant also addresses obviousness.

The Koksang '880 patent does not prima facie anticipate Applicants' claimed invention. Specifically, pending claim 1 specifies that the average particle size for the claimed collection of metal vanadium oxide particles is less than a micron. It is further emphasized that in Appeal No. 2006-0712, the Board stated: "As correctly argued by appellants (Brief, pages 8-10; Reply Brief, pages 2 and 3), Koksang does not disclose or suggest that the range of particle sizes taught is an average size or diameter as required by claim 47 on appeal and the examiner has not convincingly established that the disclosure of Koksang should be interpreted or construed as an 'average' size or diameter (Answer, page 4)." See page 3. "Furthermore, Koksang

specifically teaches the criticality of the 'particle size' of the product, disclosing a range of particle sizes but never disclosing or suggesting an average of particle sizes or diameters (col. 2, lines 59-61; col. 5, lines 1-6; and col. 6, lines 56-60). We note that the examiner has not submitted any substantive evidence that the term 'particle size' was known in this art to mean an *average particle size*." See pages 3 and 4.

The Koksbang '880 patent does **not** disclose metal vanadium oxide particles with an average particle size less than a micron either **explicitly or inherently**. The Koksbang '880 patent describes a lithium vanadium oxide, which is a species of metal vanadium oxides, "in the form of a fine powder having a surprisingly small particle size on the order of 0.1 to 5 microns, and typically less than 10 microns." Column 2, lines 59-61. The Koksbang patent **does not identically disclose** the composition of Applicants' invention since the Koksbang patent does not expressly recite that the particle size range disclosed is a range of *average particle sizes*.

Furthermore, it is clear in context that this description of particle sizes is not a description of average particle sizes. In particular, the inclusion of the description of "typically less than 10 microns" is inconsistent with 0.1 to 5 microns being a range of averages. If 0.1 to 5 microns relates to a particular distribution of particle sizes, there is some cut off in the distribution that is used to assign the end points presented. This can be picked, for example, at one standard deviation. Thus, there would be some particles with sizes larger than 5 microns and smaller than 0.1 microns. To then indicate that the particle sizes are typically less than 10 microns would imply that a more stringent criterion is being used to indicate "typically," for example, 90 percent or 95 percent of the particles. This interpretation is perfectly consistent although not explained in the Koksbang patent. So if the "0.1 to 5 microns" is a distribution, the expression "typically less than 10 microns" is not inconsistent. However, if "0.1 to 5 microns" refers to average particle sizes, the expression "typically less than 10 microns" is **inconsistent since a description clearly relating to the distribution would then be contrasted with averages without explanation**.

Since there is no explicit explanation otherwise, the consistent reading of the language in the Koksbang '880 patent is that all values relate to the distribution of particle sizes.

In addition, the Koksbang '880 patent has a **single example** directed to the production of lithium vanadium oxide. A **single set of reaction conditions** are described for the production of the lithium vanadium oxide from column 4, line 49 to 67. "The product was found to have a surprisingly small particle size on the order of 0.1 to 5 microns, and typically less than 10 microns." Column 5, lines 4-6. A **powder product** has a **single average particle size** and a single particle size distribution relating to the characteristics of the particles within the powder. Since the quoted language was used to describe a **single product**, it must be referring to a single distribution of particle sizes that would have a corresponding single average particle size, not a range of average particle sizes. Based on a single example with one set of reaction conditions, the only consistent interpretation of the language in the Koksbang '880 patent is that 0.1 to 5 microns refers to a single distribution with an average particle size of roughly 2.5 microns. Since the single set of particle properties disclosed in the Koksbang '880 patent have an average particle size significantly greater than the claimed particle size, the Koksbang '880 patent does not explicitly disclose a collection of metal vanadium oxide particles with an average particle size less than one micron.

Similarly, the Koksbang '880 patent does not inherently disclose metal vanadium oxide particles with an average particle size less than one micron. Specifically, the Koksbang patent explicitly discloses the particle size of the metal vanadium oxide particles. There are no particle collections in the Koksbang '880 patent with inherent size properties that are not described, so there cannot be inherent disclosure relating to average particle sizes. Since the Koksbang '880 patent does not explicitly or inherently disclose metal vanadium oxide particles with an average particle size less than a micron, the Koksbang '880 patent does not anticipate Applicants' claimed invention.

With respect to obviousness, the Examiner has clearly not stated a prima facie case for obviousness. It is simply not the Applicants' burden to establish patentability. With respect to the Examiner's assertions regarding the possible formation of Applicants' claimed particle from the particles formed by the process of the Koksbang '880 patent, this can only be relevant to an obviousness analysis. However, the Koksbang '880 patent does not teach or suggest any separation techniques. Under well established legal principles, the modification of the teachings of a reference can only be based upon the teachings of another reference or what is well known to a person of ordinary skill in the art. The Examiner has not asserted that appropriate teaching is well known in the art or provided a reference that describes appropriate knowledge being well known in the art. If it was well known to a person of ordinary skill in the art how to form the claimed particle collections from the particle collections described in the Koksbang '880 patent, it should be possible for the Examiner to provide such a reference. Similarly, the Examiner has not asserted or implied in the phone conferences that he has personal knowledge that appropriate approaches are known in the art for performing the requires submicron particle separation.

Cited references must teach all of the claim elements. Specifically, the cited art must place the invention in the hands of the public to support an obviousness or anticipation rejection. The Koksbang '880 patent simply does not put the invention in the hands of the public. Certainly, with respect to Applicants' claimed invention, the Examiner has fallen far short of meeting his burden of establishing prima facie anticipation or obviousness.

If a person of ordinary skill in the art could practice the claimed invention without undue experimentation based on the disclosure in the Koksbang '880 patent, the Examiner should easily be able to support that assertion with some kind of evidence. The Examiner has presented no evidence to support an obviousness rejection over the Koksbang '880 patent.

Since the Examiner has fallen short of establishing prima facie unpatentability of Applicants' claimed invention, the rejection should be withdrawn.

22

Application No. 09/969,025

Group 2 Claim

The claims of group 2 relate to collections of metal vanadium oxide particles with an average particle size from 5 nm (0.005 microns) to 100 nm (0.1 microns). As indicated above, the Koksbang '880 patent does not disclose metal vanadium oxide particles with an average particle size of less than about 1 micron, let alone average particle size from 0.005 microns to 0.1 microns. Therefore, the Examiner has failed to establish prima facie anticipation of this claim.

C. REJECTION OVER TAKAMUKI '738 – Third grounds of rejection

The Examiner rejected claims 1-3, 10, 22, and 24-29 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 5,556,738 to Takamuki et al. (the Takamuki '738 patent). Applicants respectfully request reconsideration of the rejection based on the following analysis. The Examiner has failed to establish a prima facie case of obviousness. The same deficiencies present in the Koksbang '214 patent and the Koksbang '880 patent regarding metal vanadium oxide particles having an average diameter less than about 1 micron are also present in the Takamuki '738 patent.

Also, Examiner rejected dependent claims 22 and 24-29 using the Takamuki '738 patent without rejecting the corresponding independent claim 17 using the Takamuki '738 patent. Applicants respectfully request clarification of the status of claims 17, 22, and 24-29 with respect to the Takamuki '738 patent. Applicants will address claims 17, 22, and 24-29 under the Takamuki '738 patent.

Group 1 Claims

Group 1 claims are directed to "...particles comprising metal vanadium oxide, the particles having an average diameter less than about 1 micron." In the Office Action dated July 16, 2007, Examiner states that "Takamuki '738 discloses fine particles comprising mixed metal



oxide having a particle size (see column 5, lines 21-23) and specifically vanadium pentoxide (see column 5, lines 51 and 52)." Examiner appears to ignore that particles comprising metal vanadium oxide must not only contain vanadium atom(s) but also metal non-vanadium atom(s) in the oxide composition as disclosed in the specification. In other words, particles comprising metal vanadium oxide have a composition of  $M_xV_yO_z$ , where M refers to a non-vanadium metal atom and where x, y, and z describe the stoichiometry. Vanadium pentoxide ( $V_2O_5$ ) is NOT a metal vanadium oxide because it is missing the non-vanadium metal atom. A metal vanadium oxide composition does not refer either to physical blends of different particles or to coatings on particles. The claimed invention refers to a particular composition of matter that is formed into particles with the claimed average particle size. Applicants do not acquiesce that Takamuki teaches an oxide at all since in some contexts metal oxide "sols" refers to hydrated or hydroxide forms of the materials. Since Takamuki clearly does not teach a metal vanadium oxide, this issue is moot.

Examiner also states that "Takamuki fails to specifically disclose an average diameter of less than about 1 micron." Examiner stated that it's obvious by citing to Takamuki's disclosure of "mixed metal oxide having a particle size of 1-300 (see column 5, lines 21-23) and specifically 30 nm for vanadium pentoxide (see column 5, lines 51 and 52), and a gelatin shell of 1-500 nm which is previously cross-linked to increase miscibility (see column 5, lines 58-60, 65, 66)." These citations of Takamuki fail to disclose metal vanadium oxide particles with an average diameter of less than about 1 micron. Column 5, lines 21-23 is not directed to metal vanadium oxide particles. Column 5, lines 51 and 52 is also not directed to metal vanadium oxide particles. Column 5, lines 58-60 is not directed to either metal vanadium oxide particles or particle size but the thickness of a gelatin shell. Not only do these citations fail to disclose the claimed invention, Examiner failed to provide a reason for modifying these citations to the claimed invention of metal vanadium oxide particles with an average diameter of less than about

1 micron (e.g. Examiner failed to provide a secondary reference that makes up for the deficiencies of Takamuki). Thus, the Examiner has failed to establish prima facie obviousness of the Group 1 claims.

### Group 3 Claim

The claim of group 3 relate to collections of metal vanadium oxide particles with an average particle size from 5 nm (0.005 microns) to 50 nm (0.05 microns). As indicated above, the Takamuki '738 patent does not disclose metal vanadium oxide particles with an average particle size of less than about 1 micron, let alone average particle size from 0.005 microns to 0.05 microns. Thus, the Examiner has failed to establish prima facie obviousness of the Group 3 claim.

### Group 4 Claims

Group 4 claims is directed to "[a] method of producing particles of metal vanadium oxide comprising heating a mixture of vanadium oxide particles with a non-vanadium metal compound, the vanadium oxide particles having an average diameter less than about 1 micron." In the Office Action dated July 16, 2007, Examiner basically repeated his rejection for claim 1 only to add that "wherein the particles are mixed at a temperature of 30-80 degrees Celsius." Examiner completely ignores the step of heating vanadium oxide particles with a non-vanadium metal. Col. 5, lines 51 and 52 as cited by the Examiner discloses vanadium pentoxide, which is an example of inorganic fine particles used in Takamuki's invention. Takamuki also discloses mixing a gelatin aqueous solution and an aqueous dispersion of inorganic fine particles, gradually adding a cross-linking agent, and stirring at a temperature of 30-80 degrees Celsius. Col. 6, lines 12-18. Takamuki discloses heating a vanadium oxide with a gelatin or cross-linking agent NOT a non-vanadium metal compound. Also, as indicated above, Examiner states that

the limitation of average diameter of less than about 1 micron is obvious without providing any teaching, motivation, or suggestion. Thus, the Examiner failed to establish prima facie obviousness of group 4 claims.

#### Group 5 Claims

Claims are directed to crystalline metal vanadium oxide. Examiner states that it's obvious because "Takamuki disclose both tabular and crystal grains (column 3, lines 19-22)." The crystal grains are directed to silver halides regarding the growth of silver halides and achieving high sensitivity. Takamuki does not disclose crystalline metal vanadium oxide. As indicated above, Takamuki fails to disclose particles comprising metal vanadium oxide. Also indicated above, Examiner states that the limitation of average diameter of less than about 1 micron is obvious without providing any teaching, motivation, or suggestion. Thus, the Examiner failed to establish prima facie obviousness of Group 5 claims.

#### Summary

The Examiner has failed to meet his burden of establishing prima facie unpatentability of Applicants' claimed invention based on the Koksang '214 patent, the Koksang '880 patent, and the Takamuki '738 patent. Applicants respectfully request withdrawal of the rejection of claims 1-3, 10, 17-22, and 24-29.

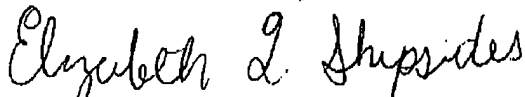
#### CONCLUSIONS AND REQUEST FOR RELIEF

Applicants submit that claims 1-3 and 6-29 are in condition for allowance. Thus, Applicants respectfully request the reversal of the rejections of claims 1-3, 10, 17-22, and 24-29 and the allowance of claims 1-3 and 6-29.

26

Application No. 09/969,025

Respectfully submitted,



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**APPEALED CLAIMS APPENDIX**

1. A collection of particles comprising metal vanadium oxide, the particles having an average diameter less than about 1 micron.
2. The collection of particles of claim 1 wherein the particles have an average diameter from about 5 nm to about 100 nm
3. The collection of particles of claim 1 wherein the particles have an average diameter from about 5 nm to about 50 nm.
- 4-5. (Cancelled)
6. The collection of particles of claim 1 wherein less than about 1 particle in  $10^6$  have a diameter greater than about four times the average diameter of the collection of particles.
7. The collection of particles of claim 1 wherein less than about 1 particle in  $10^6$  have a diameter greater than about two times the average diameter of the collection of particles.
8. The collection of particles of claim 1 wherein the collection of particles have a distribution of particle sizes such that at least about 95 percent of the particles have a diameter greater than about 40 percent of the average diameter and less than about 160 percent of the average diameter.

9. The collection of particles of claim 1 wherein the collection of particles have a distribution of particle sizes such that at least about 95 percent of the particles have a diameter greater than about 60 percent of the average diameter and less than about 140 percent of the average diameter.
10. A method of producing particles of metal vanadium oxide comprising heating a mixture of vanadium oxide particles with a non-vanadium metal compound, the vanadium oxide particles having an average diameter less than about 1 micron.
11. The method of claim 10 wherein the vanadium oxide particles have an average diameter from about 5 nm to about 100 nm.
12. The method of claim 10 wherein the non-vanadium metal compound comprises silver nitrate.
13. The method of claim 10 wherein the vanadium oxide particles comprise crystalline  $V_2O_5$ .
14. The method of claim 10 wherein the heating is performed at a maximum temperature from about 200°C to about 330°C.
15. The method of claim 10 wherein the heating is performed at a maximum temperature from about 200°C to about 300°C.
16. The method of claim 10 wherein the heating is performed for less than about 20 hours.

17. A battery comprising a positive electrode having active particles comprising metal vanadium oxide within a binder, the active particles having an average diameter less than about 1 micron.
18. The battery of claim 17 wherein the active particles have an average diameter from about 5 nm to about 100 nm.
- 19-21. (Cancelled)
22. The battery of claim 17 wherein the positive electrode further comprises supplementary, electrically conductive particles.
23. The battery of claim 17 wherein less than about 1 active particle in  $10^6$  have a diameter greater than about four times the average diameter of the collection of active particles.
24. The collection of particles of claim 1 wherein the particles have an average diameter less than about 500 nm.
25. The method of claim 10 wherein the vanadium oxide particles having an average diameter less than about 500 nm.
26. The battery of claim 17 wherein the active particles have an average diameter less than about 500 nm.
27. The collection of particles of claim 1 wherein the metal vanadium oxide is crystalline.

28. The method of claim 10 wherein the metal vanadium oxide is crystalline.
29. The battery of claim 17 wherein the metal vanadium oxide is crystalline.



**EVIDENCE APPENDIX**

A - U.S. Patent 5,549,880 to Koksbang was filed by the Applicant in an Information Disclosure Statement on April 30, 2001 but received by the USPTO on May 4, 2001 and considered by the Examiner on June 27, 2001. This patent was cited by the Examiner in subsequent Office Actions beginning with the Office Action dated July 7, 2001.

B - U.S. Patent 5,512,214 to Koksbang was first cited by the Examiner in an Office Action dated August 8, 2002.

C - U.S. Patent 5,556,738 to Takamuki was first cited by the Examiner in an Office Action dated February 7, 2007.

**RELATED PROCEEDINGS APPENDIX**

The decision for Appeal No. 2006-0712 before the Board of Patent Appeals and Interferences is attached. This appeal involved a rejection over U.S. Patent 5,549,880 to Koksbang.

4w 2950.32-05-03

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

## UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

Ex parte XIANGXIN BI, NOBUYUKI KAMBE,  
SUJEET KUMAR, and  
JAMES T. GARDNER

Appeal No. 2006-0712  
Application No. 09/606,884

ON BRIEF

MAILED

MAR 09 2006

U.S. PATENT AND TRADEMARK OFFICE  
BOARD OF PATENT APPEALS  
AND INTERFERENCESRECEIVED  
DOCKETING

MAR 13 2006

PATTERSON, THUENTE, SKAAR  
& CHRISTENSEN, P.A.

Before GARRIS, WARREN, and WALTZ, Administrative Patent Judges.  
WALTZ, Administrative Patent Judge.

## DECISION ON APPEAL

This is a decision on an appeal from the primary examiner's final rejection of claims 47 through 52.<sup>1</sup> The remaining claims pending in this application are claims 1, 4 through 11, 13 through 28, and 30 through 46, all of which have been allowed by the

<sup>1</sup>An amendment subsequent to the final rejection was submitted by appellants and entered by the examiner (see the amendment dated Mar. 5, 2004, entered as per the Advisory Action dated Mar. 23, 2004: Brief, page 2). We note that the word "collection" in claims 48-50 does not find antecedent basis in claim 47.

Appeal No. 2006-0712  
Application No. 09/606,884

Page 2

examiner (Brief, page 2; Answer, page 2, ¶(3)). We have jurisdiction pursuant to 35 U.S.C. § 134.

According to appellants, the invention is directed to cathode compositions comprising submicron vanadium oxide particles and a binder, where these particles provide superior battery performance, especially in lithium-based batteries (Brief, page 2). Representative independent claim 47 is reproduced below:

47. A cathode composition comprising vanadium oxide particles having an average diameter from about 5 nm to about 500 nm and a binder.

The examiner has relied on Koksbang, U.S. Patent No. 5,549,880, issued on Aug. 27, 1996, as the sole evidence of unpatentability (Answer, page 3). Claims 47-52 stand rejected under 35 U.S.C. § 102(a) and (e) as anticipated by Koksbang (*id.*). For reasons stated in the Brief, Reply Brief, and below, we reverse the rejection on appeal.

#### OPINION

The examiner finds that Koksbang discloses secondary lithium batteries comprising a "lithiated vanadium oxide cathode active material," a lithium metal anode, and a polymer electrolyte or solid electrolyte separator, where the vanadium oxide particles are

Appeal No. 2006-0712  
Application No. 09/606,884

Page 3

"in the form of a fine powder having a surprisingly small particle size on the order of 0.1 to 5 microns" (Answer, page 3).

The initial burden of establishing unpatentability, on any ground, rests with the examiner. See *In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). As correctly argued by appellants (Brief, pages 8-10; Reply Brief, pages 2-3), Koksbang does not disclose or suggest that the range of particle sizes taught is an average size or diameter as required by claim 47 on appeal and the examiner has not convincingly established that the disclosure of Koksbang should be interpreted or construed as an "average" size or diameter (Answer, page 4). The examiner has cited the different methods of preparation taught by Koksbang as evidence that it is "reasonable" to interpret the range taught by the reference as a range of average particle sizes, which thus overlap with the claimed range (*id.*). This evidence is not convincing for the following reasons. As correctly argued by appellants (Reply Brief, page 2), there is no disclosure or suggestion in Koksbang that the variation in reaction starting materials or parameters would alter the product properties, e.g., the particle sizes of the product (see col. 4, ll. 15-65). Furthermore, Koksbang specifically teaches the criticality of the "particle size" of the product, disclosing a range of particle

Appeal No. 2006-0712  
Application No. 09/606,884

Page 4

sizes but never disclosing or suggesting an average of particle sizes or diameters (col. 2, ll. 59-61; col. 5, ll. 1-6; and col. 6, ll. 56-60). We note that the examiner has not submitted any substantive evidence that the term "particle size" was known in this art to mean an average particle size.

The examiner has found that the vanadium oxide particles disclosed by Koksbang are in the form of a fine powder with a particle size "on the order of 0.1 to 5 microns" (Answer, page 3). However, the examiner admits that Koksbang discloses "a lithiated vanadium oxide cathode active material" (Answer, page 3), and Koksbang only discloses particle sizes for the lithium vanadium oxide product (col. 2, ll. 59-61; col. 5, ll. 1-6; and col. 6, ll. 56-61). We find no disclosure in Koksbang of any particle size for the vanadium oxide per se (e.g., see col. 4, ll. 15-40). We have construed the term "vanadium oxide particles" as found in claim 47 on appeal with "the broadest reasonable meaning of the words in their ordinary usage as they would be understood by one of ordinary skill in the art," taking into account any enlightenment of the term in the specification. *In re Morris*, 127 F.3d 1048, 1054, 44 USPQ2d 1023, 1027 (Fed. Cir. 1997). Appellants' specification discloses vanadium oxide nanoparticles per se, as well as the production of only vanadium oxide (see Figures 5-12; specification,

Appeal No. 2006-0712  
Application No. 09/606,884

Page 5

page 4, li. 19-21; page 5, l. 18-page 6, l. 17; and page 14, l. 8 et seq.). Although the transitional term "comprising" opens claim 47 on appeal to other elements or components,<sup>2</sup> we determine that the claimed "vanadium oxide particles," as understood by one of ordinary skill in this art and consistent with the specification, does not encompass other materials such as intercalated lithium.<sup>3</sup>

For the foregoing reasons and those set forth in the Brief and Reply Brief, we determine that the examiner has failed to establish a prima facie case of anticipation in view of Koksang. Therefore we cannot sustain the rejection on appeal.

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<sup>2</sup>See *Vehicular Techs. v. Titan Wheel Int'l, Inc.*, 212 F.3d 1377, 1383, 54 USPQ2d 1841, 1845 (Fed. Cir. 2000) ("A drafter uses the term 'comprising' to mean 'I claim at least what follows and potentially more.'").

<sup>3</sup>See related Appl. No. 09/246,076, now U.S. Patent No. 6,225,007 B1, issued May 1, 2001.


Appeal No. 2006-0712  
Application No. 09/606,884

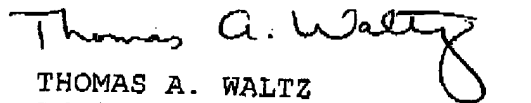
Page 6

The decision of the examiner is reversed.

REVERSED

  
BRADLEY R. GARRIS  
Administrative Patent Judge

  
CHARLES F. WARREN  
Administrative Patent Judge

  
THOMAS A. WALTZ  
Administrative Patent Judge

BOARD OF PATENT  
APPEALS  
AND  
INTERFERENCES

TAW/sld



Appeal No. 2006-0712  
Application No. 09/606,884

Page 7

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